THE NATURE CONSERVANCY NEWS

July/August 1982

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THE NATURE CONSERVANCY NEWS

VOLUME 32, NUMBER 4
JULY/AUGUST 1982

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COVER: The king vulture *(Sarcoramphus papa)*, wide-ranging bird of the Neotropics. Dependent upon Latin America's wild forests for its survival, the species is declining in population. Photo by Paul E. Gertler.

The Nature Conservancy is a national conservation organization committed to the preservation of natural diversity by protecting lands containing the best examples of all components of our natural world.

To date the Conservancy and its members have been responsible for the preservation of 1,865,108 acres of forests, marshes, prairies, mountains, and islands: home to rare and endangered species of wildlife and plants. 2,932 projects have been completed since the acquisition of the first preserve in 1954. Approximately 60% of all preserves are retained by the Conservancy and managed by staff and volunteer land stewards.

A membership, non-profit organization, the Conservancy was incorporated in 1951 in the District of Columbia for scientific and educational purposes.

A copy of the last financial report filed with the Department of State may be obtained by writing to: New York State, Department of State, Office of Charities Registration, Albany, New York 12231, *or* The Nature Conservancy, 1800 North Kent Street, Arlington, Virginia 22209.

Thinking Globally, Acting Locally

by Spencer B. Beebe
Vice President and Director
International Program

THE EARTH SUPPORTS an estimated 250,000 species of vascular plants, 4,100 species of mammals, and 8,700 species of birds. Less than 10 percent of these plants and animals are found in the United States. Most of the planet's biotic diversity exists beyond our borders, especially in the tropics. For example, California provides habitat for some 6,000 vascular plants, the largest number of plants found in any U.S. state; but Costa Rica, roughly one-eighth the size of California, harbors 12,000. A single park in Ecuador supports an estimated 850 bird species—30 percent more than are found in North America. Like Ecuador, Venezuela is so rich in flora and fauna that The Nature Conservancy could conceivably protect more plant and animal species in only one conservation project there than it has protected in its entire U.S. history.

The Conservancy's domestic efforts to preserve natural diversity are far from complete. But the organization's maturity and achievements at home should enable it to share its expertise with other countries and to learn from conservation experiences abroad. Such a global view is critical. There are over 2,000 parks and protected areas around the world, covering more than 350 million hectares —roughly 3.2 percent of the Earth's surface. (One hectare equals 2.47 acres.) If properly distributed and managed, these sites might do a reasonable job of preserving the full range of the world's natural diversity. Unfortunately, existing parks and protected areas are neither adequately distributed nor consistently well-managed. For example, grassland systems, dry forests, and some island systems are not as well represented as coniferous forests and mountain systems. In Mexico, 90 percent of the parks are in pine forests, and nearly all New Zealand's parks exist in mountainous areas, leaving many lowland ecosystems unrepresented and unprotected.

The conservation of living resources in other countries has always been a Conservancy objective. The Conservancy's precursor organization, the Ecological Society of America's Special Committee for the Preservation of Natural Conditions, did not distinguish between conservation objectives in the U.S. and in any other countries of the world. From 1962 to 1969 The Nature Conservancy maintained a "Latin America desk" through which it attempted to aid and encourage the efforts of Conservancy-like organizations elsewhere in the hemisphere. Then, from 1974 to 1979, the Conservancy's International Program took a more di-

rect approach under Michael Wright's leadership and concentrated on helping government agencies and local conservationists to protect a variety of outstanding ecological reserves in Canada, the Caribbean, and Central America. Lands were safeguarded with Conservancy assistance in 13 conservation projects encompassing over 100,000 acres. Comparing the dollars actually invested in one of these projects—the 89,000-acre Corcovado National Park in Costa Rica—with recent Conservancy projects in the U.S., we find that the Conservancy saved roughly ten times as many species and 50 times as much land per dollar spent on Corcovado than the average spent on U.S. projects.

Over the past few years, the Conservancy's International Program has been expanded significantly. A Board of Governors International Committee and an outside International Advisory Committee composed of prominent international conservationists, scientists, and businessmen have been created. Charles J. Hedlund, a board vice chairman, chairs both committees. Staff of the International Program has grown from two to eight Spanish-speaking professionals. The program has also adopted a new approach to conservation abroad—an approach aptly described by the late scientist and writer René Dubos: "Think globally, but act locally."

The task of preserving ecologically significant lands in other countries can be done effectively only by local people, applying local resources and knowledge to local problems. Therefore, the International Program's new strategy is to invest primarily in people rather than directly in land. To date, program staff members have made contacts in virtually every Latin American country and have initiated discussions with leaders of national conservation organizations and government agencies in Costa Rica, Ecuador, Venezuela, Argentina, the Netherlands Antilles, and Mexico. Through conservation fellowship programs and technical workshops, the Conservancy is sharing its land preservation experience with conservationists in each of these countries. Consequently, these individuals and the institutions they represent are developing their own solutions to local conservation problems. And by sharing skills, training people, and shaping programs that will sustain preservation endeavors in other nations, the Conservancy's International Program has begun constructing a sound foundation for international conservation efforts around the world.

Costa Rica: Model for Conservation in Latin America

by Geoffrey S. Barnard
Costa Rica Field Representative

RAIN FORESTS harboring howler monkeys and elusive jaguars . . . cloud forests sheltering brilliantly hued quetzals . . . remote pristine beaches where sea turtles nest . . . 1,200 species of native orchids . . . steaming volcanic craters . . . vast marshes abounding with waterfowl . . . mangroves, oak forests, swamps, and coral reefs. . . . These are some of the natural features of Costa Rica, a tropical nation of Central America. No other country of similar size in the world can match Costa Rica's diverse flora and fauna, and Costa Ricans are proud of their natural wealth. Nonetheless, each year thousands of acres of this ecologically rich country—habitat for the endangered harpy eagle, the vanishing scarlet macaw, two- and three-toed sloths, four imperiled cats, and scores of still unknown species—are destroyed.

The Costa Rican government has recognized the problem: in the past 12 years it has succeeded in protecting over 1 million acres of ecologically significant land in 22 separate units. Safeguarded through the country's National Park Service and Forest Service, this wide range of natural habitats and ecosystems exists in a system of national parks, biological reserves, wildlife refuges, and protected zones. Some of these preserved areas attract large numbers of visitors each year (around (650,000 in 1980 alone); others serve as biological laboratories where national and international scientists add to the world's understanding of tropical ecosystems.

The success of the Costa Rican government is impressive, but its efforts alone are not sufficient to protect the country's ecological resources. Development encroaches on the parks and refuges; key sites within the preserved areas remain in private hands; new reserves and important additions to existing parks have not been acquired because funds are scarce; lack of equipment makes management difficult; and educating the public about the value of natural lands has fallen far behind other conservation efforts.

SEVERAL YEARS AGO, conservation leaders of Costa Rica realized that a private nonprofit organization was needed to help the government consolidate and protect the existing system of parks, refuges, and reserves. The National Parks Foundation, created in 1979 under Costa Rican law, is focusing not only on the country's system of preserved natural areas, but on the promotion of environmental education programs as well. The Foundation is governed by a board of five directors. Although it frequently assists the government in natural-area acquisition and management, the Foundation is supported entirely by private donations from individual gifts, foundation grants, and corporate contributions.

The Foundation has also received generous support from international conservation organizations, such as the World Wildlife Fund, Caribbean Conservation Corporation, Rare Animal Relief Effort (RARE), and the Philadelphia Conservationists. All these groups have contributed money, technical aid, and advice. Their assistance continues to play an important role in the Foundation's development; but as the need for tropical forest preservation was more clearly defined, the Foundation's financial base had to be expanded. The National Parks Foundation decided to present its program to a broad range of potential individual, corporate, and foundation donors, in Costa Rica and other countries.

The Nature Conservancy also is assisting the Foundation by sharing expertise and providing an in-country advisor for a full year (1982), and by undertaking a cooperative training program. In late 1981, a Costa Rican named José Mora worked and trained in the Conservancy's International Office and in the Minnesota Field Office, learning methods of land acquisition, preserve planning, and fund raising.

The Foundation, meanwhile, had achieved one of its treasured objectives. La Amistad International Park, which was created on February 4, 1982, is a joint conservation project between Costa Rica and its neighbor, Panama. Spanning 480,000 acres (or 4 percent of the nation) in the rugged mountains of southern Costa Rica, La Amistad doubles the size of the Costa Rican National Park System and preserves 8 of the country's 12 major biological life zones. The park was created in the hope of working cooperatively with Panama to protect a similar-sized area (basically an extension of La Amistad) in that country. The favorable national and international attention the new

The endangered harpy eagle.

Costa Rican park received is helping Panama to solidify its plans. The World Wildlife Fund immediately funded initial costs of La Amistad—$12,000 for basic equipment like tents, horses, backpacks, and a vehicle, so that park personnel could penetrate the remote area and establish on-site protection.

Ranging between 650 and 11,500 feet in elevation, La Amistad Park encompasses a virtually untouched tropical rain forest and montane cloud forest. Its location astride the continental divide—with vast forests dropping down to the Atlantic and Pacific coasts on either side—and its great range of altitudes foster habitats for exceptional animal populations. It is estimated that the sanctuary shelters populations representing two-thirds of Costa Rica's total vertebrate fauna. Animals like jaguar, puma, tapir, and harpy eagle require extensive areas for hunting, foraging, and reproduction. For them the park is an ideal refuge.

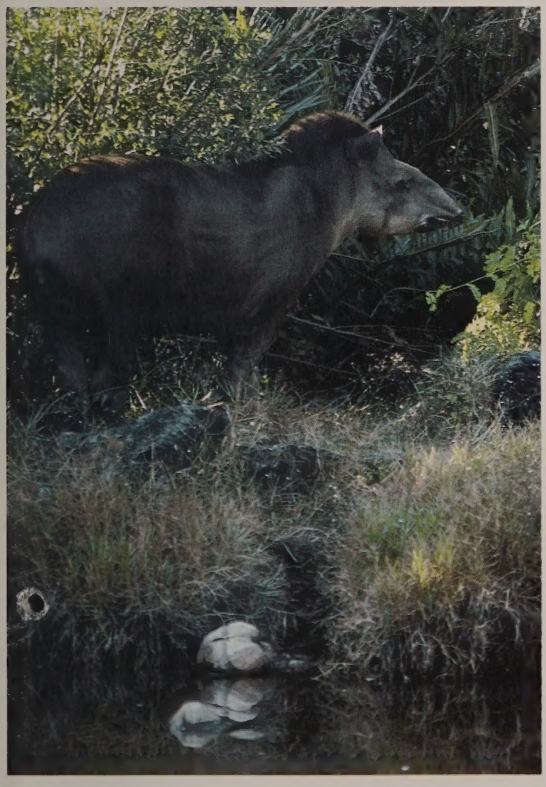
Preliminary surveys show that La Amistad contains 250 species of reptiles and amphibians (10 not protected in other Costa Rican refuges), 215 mammals (13 not protected elsewhere), and 560 bird species (15 not safeguarded elsewhere). Furthermore, comparing the park's fauna with the official Costa Rican list of endangered species shows that the area shelters 9 of the 11 listed endangered bird species, 13 of the 16 endangered mammals, and all endangered species of reptiles and amphibians.

THE COSTA RICAN National Parks Foundation is also struggling with the critical problem of privately held lands within the country's system of parks and reserves. Some of the preserved areas are all publicly owned. Yet others, because they have been designated as sanctuaries but still not acquired, are almost entirely private lands. And the restive landowners want to sell their properties or have them removed from the system. Consequently, the Foundation has launched a major campaign to acquire these key sites. Tortuguero National Park on the Caribbean coast is a prime example. A relatively small amount of money, $19,000, is being sought to buy the last seven *fincas* in the park. These farms are small but include extensive beach frontage.

The beach at Tortuguero is one of the few remaining sites in the western Caribbean where large numbers of endangered green sea turtles still nest. Also endangered, the hawksbill and leatherback turtle regularly use the shoreline, depositing their eggs in the sand and then returning to the sea. Since illegal gathering of turtle eggs continues throughout Costa Rica and neighboring tropical countries, Tortuguero's 15-mile beach provides critical habitat for successful sea turtle nesting and reproduction.

Tortuguero National Park has an unusual combination of plants and animals. Because its lowland forest and flora are similar to that of the lush, humid Amazon Basin, the refuge harbors fauna that has successfully dispersed from the south. This situation exists through Costa Rica and northwest into Nicaragua, but the wildlife typical of the unique association is concentrated in Tortuguero. The endangered tapir—the largest neotropical land mammal—scavenges the forest floor for roots and fallen fruits. The even more imperiled jaguar prowls the jungle, possibly searching for young tapir, one of the cat's favored prey. The park's offshore areas support Costa Rica's only known breeding population of West Indian manatee, an endangered aquatic mammal.

ACROSS THE MOUNTAINS from Tortuguero, on the Pacific coast, The Nature Conservancy and the Foundation are joining forces to meet a much larger challenge. The Conservancy is working to help acquire 6,400 acres in the heart of the Palo Verde National Park. Held by three owners, the lands are immediately threatened by deforestation, drainage, and conversion to sugar cane.



Top: baby green sea turtles ply the sand. The threatened reptiles nest in concentration on the beaches of Costa Rica's Tortuguero on the Caribbean. Above: the tapir, largest land mammal in the Neotropics.

The 23,500-acre park protects a series of interconnected marshes near the mouth of the Tempisque River in northwestern Costa Rica. Together with the contiguous Palo Verde National Wildlife Refuge, it provides the most significant waterfowl habitat in the country. It is estimated that 75 percent of the wetlands in the Tempisque lowlands have been drained and farmed, so the park and refuge are critical to the survival of a number of waterfowl species.

In all, some 260 species of birds are reported to use the area, including 115 species of North American migratory birds. The marshes swarm with wood storks, roseate spoonbills, white and glossy ibises, and 12 species of herons and egrets. The refuge and park also harbor several active nests of the jabiru stork. One of Costa Rica's most endangered birds, the jabiru has dwindled to some 25 individuals.

Because Palo Verde's marshes are bordered by seasonally dry tropical forests, an "oasis effect" occurs during the six-month dry season. Wildlife in search of permanent sources of water concentrates around the marshes and rivers. Howler, white-faced, and spider monkeys; collared peccaries (distantly related to pigs), caimans, and iguanas are found in a variety of habitats within the refuge and park.

Another key preservation priority involves the mountainous Braulio Carrillo National Park, which straddles Costa Rica's Central Volcanic

Jabiru storks (at right)—two of Costa Rica's 25 or so remaining individuals—nest at Palo Verde on the Pacific Ocean. The 23,500-acre park protects a network of bird-rich marshlands (below).

Corcovado on the Osa Peninsula. The Conservancy helped raise funds for the establishment of this outstanding Costa Rican national park, a lush rain-forest refuge for tropical fauna, in 1976.

Range just a few miles from the capital city, San José. Braulio Carrillo protects the summits of several extinct volcanoes, their slopes blanketed by diverse cloud forest.

Some 20 miles from Braulio Carrillo's 9,000-foot volcanic peaks lies the La Selva Field Station of the Organization for Tropical Studies. No more than 100 feet in altitude, La Selva exists in the flat, lowland jungle. It may be possible to connect La Selva with Braulio Carrillo National Park. If combined, the total acreage would provide a continuous refuge stretching from one vastly different elevation to the other—an unusual altitudinal transect of land unlike any currently unprotected in Central American parks, and perhaps anywhere in the American tropics.

Because of the gentle grade between the highest and lowest points in the proposed park extension, all intermediate elevations are well represented by substantial amounts of land. This zone supports outstanding examples of major Atlantic-slope wet forest types, which are inhabited by at least 22 species of birds endemic to Costa Rica. La Selva Station also has recorded 400 bird species—including the bare-necked umbrella bird and the three-wattled bellbird, whose song sounds like a huge clanging bell—63 bats, and 1,600 to 2,000 species of higher plants. Many insects, including pollinators such as orchid bees and some butterflies, migrate altitudinally within the site. If protected, the total area would encompass a 125,000-acre pristine rain-forest reserve of global significance.

A major international effort is required to protect the beaches of Tortuguero National Park, the private lands within the Palo Verde National Park and Wildlife Refuge, and the vast stretch between Braulio Carrillo and the La Selva Field Station. The Costa Rican National Parks Foundation has undertaken these tasks with enthusiasm and the conviction that people throughout the Americas will support preservation of the rich Costa Rican tropics. The benefits of protecting these ecologically rich areas do not reward Costa Rica alone. Countries throughout the world are ultimately dependent upon the biological wealth and genetic resources of the Earth's tropical lands.

Whose Birds Are They?

by Roger F. Pasquier

ALTHOUGH SCIENTISTS are continually warning against thinking of animal behavior in human terms, until recently the usual image of North American birds wintering in the tropics was similar to that of a human tourist vacationing in the tropics: a leisurely life at a fully equipped resort, little mixing with the natives, a limited effect on the local way of life. Now, however, because the breeding and migratory aspects of the annual cycles of most North American birds are well known, more ornithologists are studying these species in their winter homes. As a result, notions of the birds' activities and significance in the tropics are changing rapidly. Indeed, one of the first assumptions subject to challenge is the idea that birds breeding in North America but wintering mainly or entirely south of the border should properly be called "ours." Nearly half the birds that breed in North America head south each year and spend up to six or seven months on their wintering grounds, perhaps another month or two commuting each way, and only a brief eight or ten weeks building a nest and raising their young before going south again. The countries where these species winter may justifiably claim the birds as their own.

It has become clear, then, that the survival of "our" birds depends on safeguarding both their wintering and breeding grounds. Habitat protection and restrictions on pesticide use or hunting in one country alone are not sufficient for sustaining creatures that do not recognize national boundaries. Recent studies of the distribution and ecology of birds wintering in the American tropics present a much clearer picture of the migrants' varied survival strategies and of the measures required to ensure the preservation of these species. Such information is of value not only to bird lovers. Since birds are often the most conspicuous component of their environment, they can serve as indicators of the general quality of that environment, providing clues to its stability or decline. Thus, an understanding of the distribution of wintering birds may assist The Nature Conservancy in determining which tropical habitats are of the highest quality or greatest ecological significance.

MOST NORTH AMERICAN BIRDS that migrate south of our border spend the winter in the Antilles, Mexico, Central America, and northern South America. The most notable exceptions to this rule are the sandpipers and plovers that breed primarily on the Arctic tundra and winter on the superficially similar pampas and coasts of Argentina. Fully half of the migrant land birds, however, winter in Mexico, the Bahamas, Cuba, and Hispaniola—an area much smaller than the regions in North America from which the birds travel. Combined, these countries encompass only 2.2 million square kilometers, compared with 16.2 million square kilometers for North America south

of the tundra. Wintering birds are therefore far more concentrated than during summer, and may suffer more severely from alterations in a small portion of their winter range.

Within the Caribbean basin, which supports the bulk of North American migrant birds, some species are even more concentrated. The Cape May warbler, for example, nests in spruce forests ranging from the southern Northwest Territories of Canada to New Brunswick, south to northern New Hampshire and west to southern Manitoba; but it winters almost exclusively in the West Indies, primarily in the Greater Antilles and Bahamas. The chestnut-sided warbler—a summer inhabitant of open second-growth forests that occur from Newfoundland west to central Saskatchewan, as well as south to New Jersey, the mountains of Georgia, and Missouri—winters from Guatemala to Panama.

The majority of wintering birds are further restricted to certain elevations. Some are found primarily in the highlands that run down the spine of Central America and join the Andean chain in South America; other species favor the lowlands. Because of such geographic and altitudinal separations, many birds are able to avoid competing with their close relatives, including some with which they share summer breeding habitat. Generally, birds wintering in the tropics fit into one of two patterns: they may be widely dispersed, but in low densities and with little tolerance for other members of their species, or they may occur in a smaller area at higher concentrations.

In addition to these general dispersion patterns, the wintering birds exhibit a wide variety of behavioral and ecological adaptations to exploit food sources quite different from those they find in North America. In Panama, for example, the migrants arrive at the end of a long rainy season when insects are relatively scarce. (On the other hand, in the Yucatan it is the December-through-February dry season that reduces insect numbers.) Many birds switch to new foods or new behavior. The Cape May warbler, already mentioned, shifts from a diet of insects to nectar and juices sucked from fruit, thereby reducing competition with the 19 other warbler species that share its winter habitat in the West Indies. Unique in its family, the Cape May warbler has evolved a tubular tongue that enables it to exploit these food sources more efficiently than its relatives. The broad-winged hawk, a summer denizen of eastern North American forests where it feeds on small birds, mammals, and reptiles, winters in Amazonia and there preys almost exclusively on the large katydids that become active at dusk.

SOME BIRDS that are territorial in the breeding season become sociable in the winter. Robins, which in spring and summer defend their piece of suburban lawn and the worms it contains, during winter months in Mexico form huge flocks that roam the countryside for fruit. Northern orioles similarly cluster in the flowering trees of Panama to feed on nectar—at dusk, hundreds may gather in noisy, colorful roosts. Shorebirds, like those

Chestnut-sided warblers, bathing on their fall migration.

wintering on the coast of Argentina, may congregate by the thousands in a few estuarine systems that each harbor a significant portion of the species' entire population.

Many of the small birds that continue to feed on insects in winter defend territories just as they do when nesting, and they return to the same tropical territory year after year. Winter territories, however, are not defended by a pair of birds for their benefit and that of their offspring, but are maintained by each individual, male and female. The preferred habitat of these territorial species is the uncut rain forest, which is climatically more stable than second-growth vegetation and thus more likely to offer a steady supply of insect food. In Puerto Rico and Mexico, it was found that the territories maintained by each individual American redstart were the same size as those used by pairs in the breeding season, indicating that food—though more constant—may be less abundant in the tropics than in temperate North America. Furthermore, some birds exhibit competition between sexes for the best habitat. In Veracruz, Mexico, male territorial hooded warblers outnumber females eight to one in uncut rain forest; but in secondary forest, females slightly outnumber males.

The ultimate form of winter territoriality is found in a few warbler species that join mixed species flocks of native birds, which move through the forest hunting for insects. These warblers specialize in probing for insects in curled-up dead leaves still attached to the branch, a practice that requires intense concentration and therefore allows less time to watch for lurking predators. By joining a flock that contains more attentive birds, the warblers gain a protective guard. At the same time, the warblers defend "their" flocks against others of their own species, thereby treating the flock as a "territory."

A very different strategy is adopted by the eastern kingbird, a pugnacious flycatcher that in summer drives even crows and hawks from its territory. In autumn, kingbirds rapidly migrate south through the tropics to the southern Amazonian basin of Peru and Bolivia. There, abandoning both aggressiveness and insect food, they cluster in large flocks at fruiting trees, primarily of the genus *Didymopanax*. As the birds exhaust the local food supply, they move north, where other *Didymopanax* are just coming into fruit. The kingbird's northward progress seems synchronized with the fruiting schedule of this tree, which evidently depends on the birds to disperse its seeds.

NOT ALL WINTERING BIRDS adopt such strict behavioral or dietary patterns. Some become generalists—taking a mixture of fruit and

Both northern orioles (left) and robins (right) desist while wintering in Latin America from the territoriality that characterizes their behavior in breeding season.

The eastern kingbird, energetically insectivorous in North America, feeds almost exclusively on fruits while wintering in Peru and Bolivia.

animal food—and move about solitarily or in small groups that may include other species of migrants or permanent residents. Often, these generalists are the birds most adept at exploiting temporarily abundant sources of food, particularly those foods found in second-growth or disturbed habitat.

Until recently, however, nearly all of tropical America was covered with forest, so the majority of North American migrant birds evolved patterns of winter survival in that habitat. Ornithologists are just beginning to learn about the complex interrelationships of migrants and permanent residents, and the ecological roles migrants play in the tropics. In the future, the survival of these migratory birds may depend on the degree to which they can adapt to different habitats and food sources.

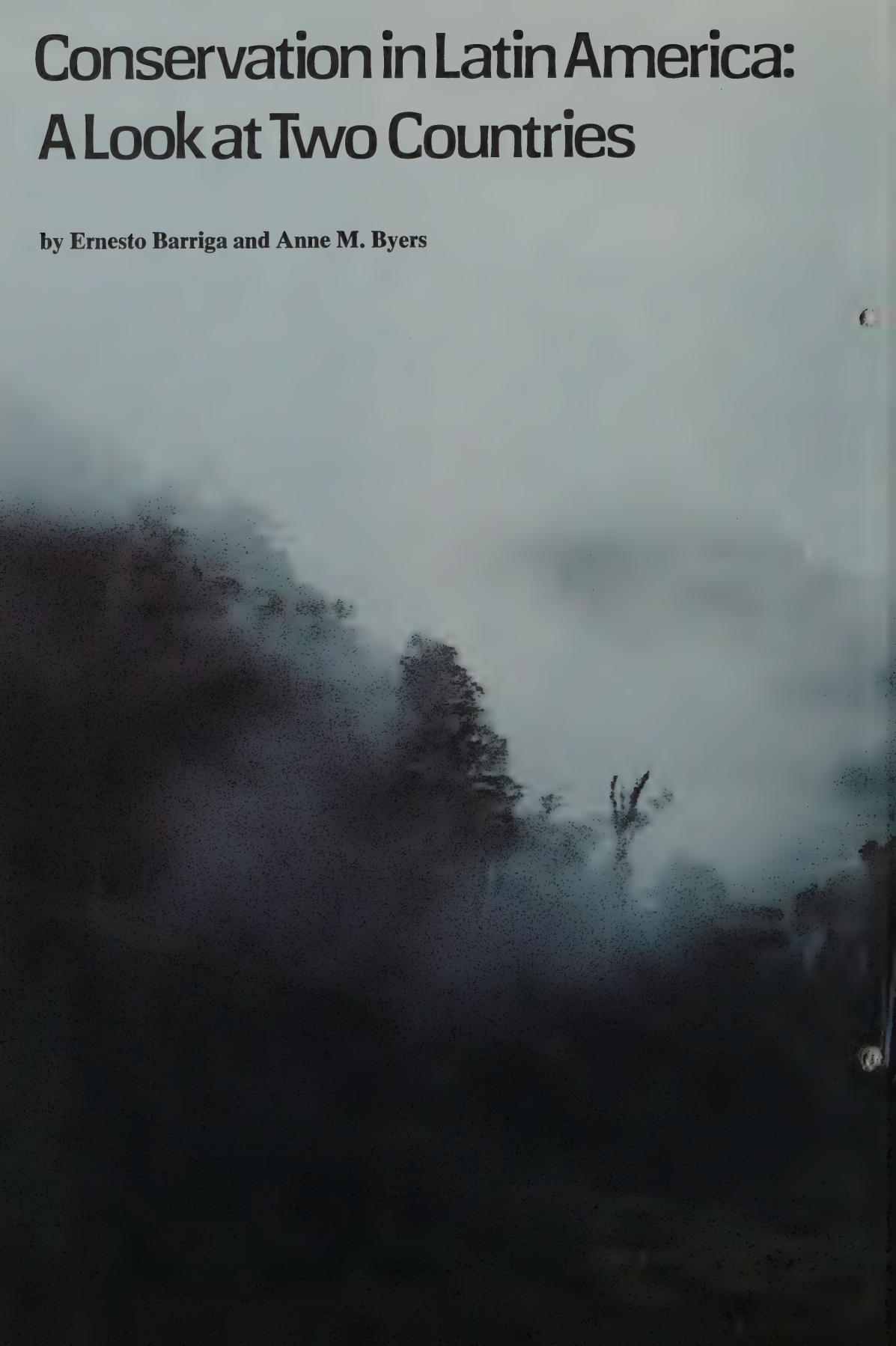
No North American bird is presently in danger of extinction because of threats to its wintering home, but the habits and geographic distribution of some species clearly place them in situations of greater risk than others. Waterbirds seem to be in little danger: despite often uncontrolled hunting, their habitats are for the most part undisturbed. Birds of prey disperse so thinly over such a large area of Central and South America that they are seldom persecuted or contaminated by pesticides. The smaller land birds, especially those dependent on forests, are the species of greatest concern. According to estimates of the Food and Agricultural Organization, over half the natural vegetation of Central America and the Greater Antilles has already been converted to cropland and pasture, and the remainder is disappearing rapidly. Because of the concentration of wintering birds in this small region, the effect of habitat loss is greater than in North America. In Mexico, for example—where in certain areas migrants constitute 50 percent of the total birdlife during winter—removing one hectare of forest has the same effect as removing five to eight hectares in northeastern North America.

Long-term studies in Veracruz, Mexico, have shown that when forested areas are altered, the territorial, forest-dependent bird species either disappear or occupy at lower densities whatever serviceable areas remain. Since other forested areas are presumably already functioning at carrying capacity, what happens to these displaced birds? Further research is required to supply all the answers, but it is clear that conservationists should focus their efforts on identifying the regions and habitats on which the greatest number of wintering species depend, and on determining how these areas may be protected. Not only will "our" North American birds benefit from such activities, but so will the entire ecosystems of which the migrants are an integral part.

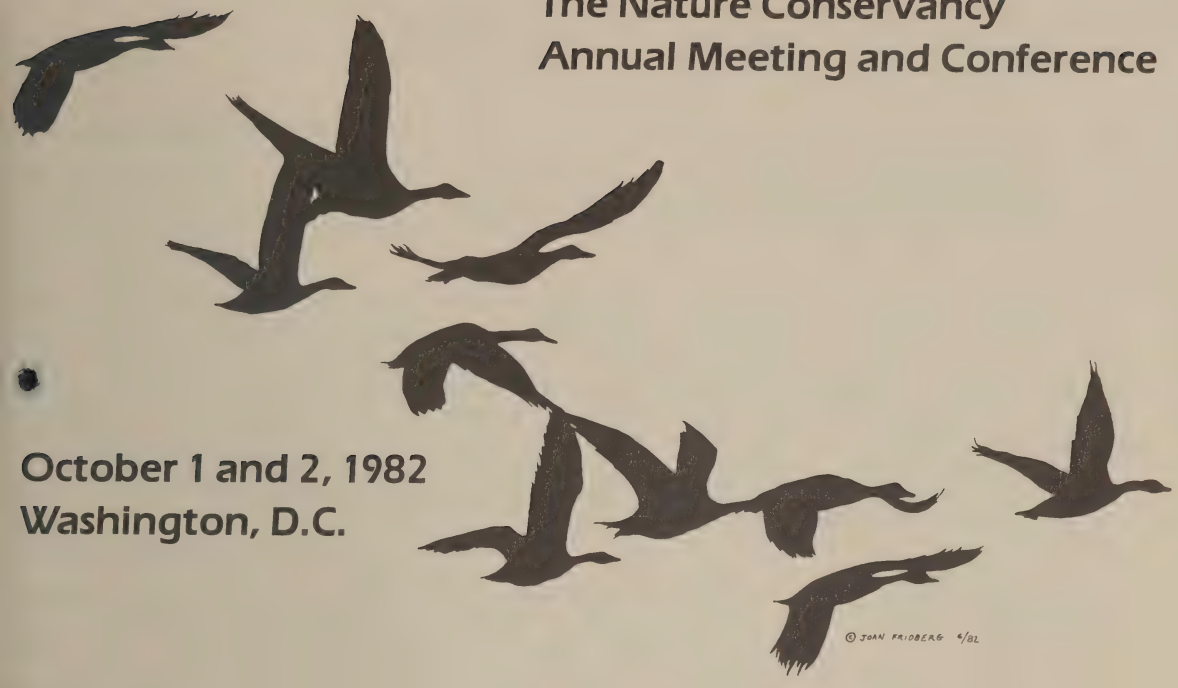
Roger F. Pasquier is executive assistant to the president of the International Council for Bird Preservation. The author of *Watching Birds: An Introduction to Ornithology*, Mr. Pasquier is presently writing a book for the Smithsonian Institution on the birds of Panama, including many winter migrants from North America.

Conservation in Latin America: A Look at Two Countries

by Ernesto Barriga and Anne M. Byers



The Nature Conservancy
Annual Meeting and Conference



October 1 and 2, 1982
Washington, D.C.

Official Notice

Notice is hereby given to the members of The Nature Conservancy that, pursuant to Article VIII, Section 2, of the Bylaws of The Nature Conservancy, 1980 revision, a membership meeting will be held at Loews L'Enfant Plaza Hotel, Washington, D.C., at 1:30 p.m. on Saturday, October 2, 1982, for the purpose of receiving reports, electing officers and governors of The Nature Conservancy for the ensuing year, and acting on such other business that may come before the meeting.

Please note the official ballot on the next page. It should be signed and returned as described therein.

William D. Blair, Jr., President

Tentative Schedule

Friday, October 1, 1982

12:00-6:00 p.m.	Registration and Hospitality
6:30-8:30 p.m.	Opening Reception U.S. Botanic Garden

Saturday, October 2, 1982

8:00 a.m.	Continental Breakfast
8:30 a.m.-noon	Open Board of Governors Committee Meetings Special Screening —"Rivers of the Deep South" —"California Critical Areas"
12:15-1:30 p.m.	Luncheon
1:30-2:30 p.m.	Annual Meeting and President's Report
3:00-6:00 p.m.	Afternoon Field Trips —National Arboretum —National Zoological Park —Dumbarton Oaks
7:00 p.m.	Reception for Awards Recipients
8:00 p.m.	Annual Awards Banquet Speaker—The Honorable James Buckley

Sunday, October 3-Tuesday, October 5

Post Conference Field Trips
—Virginia Coast Reserve
—Cape May, New Jersey

HOTEL REGISTRATION CARD

Loews L'Enfant Plaza Hotel (202) 484-1000

The Nature Conservancy
Annual Meeting and Conference
October 1 and 2, 1982

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Reservations are not transferrable and are held until 6:00 PM unless guaranteed by one of the following:

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Expiration date _____

☐ Advanced deposit (one night) $ _____

Failure to cancel by 6:00 PM the day of arrival will result in one night's charges.

Room Type	Group Rate
☐ Single (1 person)	$70.00*
☐ Double (2 people)	$80.00*
☐ Double/Double (2 beds, 2 people)	$80.00*

*plus D. C. occupancy and sales tax

Rooms may not be available for occupancy until after 3:00 PM. Check-out time is 1:00 PM.

Reservations received after September 9, 1981, will be confirmed on a space available basis.

Mail this card directly to: Reservation Manager, Loews L'Enfant Plaza Hotel, 480 L'Enfant Plaza, S. W., Washington, D. C. 20024

Post-Conference Field Trips

The Virginia Coast Reserve, our nation's last chain of undeveloped barrier islands, stretches from the Maryland/Virginia border south to the mouth of the Chesapeake Bay. On Sunday, October 3, a Conservancy group will travel to the coast to visit Parramore, the largest of the Conservancy's thirteen islands, after pausing on the way at Blackwater National Wildlife Refuge (for which the Conservancy has acquired almost 3,000 acres). Later, trip participants will enjoy a feast of the area's best known delicacy, Chesapeake Bay blue crab. Breakfasting early on Monday, October 4, the adventurers will board the good ship Jennifer in historic Wachapreague, arriving at Parramore Island by mid-morning. Birding, beachcombing, and bathing (sun and surf) will be the orders of the day on Parramore, with a break for a sack lunch near the docks of a Coast Guard station. Brownsville, a recently restored castor bean plantation home that serves as headquarters for the Reserve, will welcome the weary travelers with a fish fry on Monday evening. Up at dawn on Tuesday, October 5, the travelers will return to Washington's National Airport by 1:00 p.m.

Roger Tory Peterson has called **South Cape May Meadows** in New Jersey "one of the country's outstanding bird-watching areas." Recognizing this, the Conservancy recently secured a 180-acre sanctuary here through a gift by Combustion Engineering, Inc. Thousands of raptors, multitudes of songbirds, shorebirds, and waterfowl migrate across Cape May each fall, pausing to rest and feed here before passing over Delaware Bay. Departing Sunday, October 3, a second group from the Conservancy will take the Cape May-Lewes Ferry across the Bay to Cape May. A national historic landmark city, America's oldest seashore resort features many homes, hotels, shops, and other buildings constructed in the late 1800s—the heyday of Victorian life. Accommodations have been arranged in three of the city's most authentically restored guest houses, and an historic tour will be offered. Sunday, October 3, and Monday, October 4, offer visitors a grand opportunity to be at the best spot on the East Coast for birdwatching—assisted by leaders from the locally headquartered New Jersey Audubon Society. This tour also will return to Washington's National Airport by 3:00 p.m. on Tuesday, October 5.

The cost for either tour will be $125.00 per person. This includes two breakfasts, two lunches, one dinner, bus transportation (and boat transportation for the Virginia Coast Reserve trip). Accommodations are additional as indicated on the registration form. Space is available on a first-come/first-served basis.

NOMINATED AS MEMBERS

John E. Andrus III,* Minnesota. Former chairman, Board of Governors, The Nature Conservancy; former president, Deep Draw Corp.; director, Julia Dyckman Andrus Memorial, Inc.; chairman, Surdna Foundation; trustee, Minneapolis Society of Fine Arts; trustee, Minnesota Chapter of The Nature Conservancy.

Samuel A. Cook, Hawaii. Chairman, board of trustees, The Nature Conservancy of Hawaii; vice president, Dean Witter Reynolds Inc.; president, Cooke Land Company, a subsidiary of Molokai Ranch Ltd.; trustee, Oceanic Institute, Bishop Museum, and Honolulu Academy of the Arts; Director, Honolulu Symphony Society, Hawaiian Trust Company and Grove Farm Company; past president, Cornell Club of Hawaii.

Dr. Jerry Franklin,* Oregon. Chief Plant Ecologist, U.S. Forest Service; professor, departments of Botany and Forest Science at Oregon State University; member, Natural Heritage Advisory Council, Oregon; U.S. Leader, Project on Biosphere Reserves, US-USSR Bilateral Agreement on Environmental Protection.

Charles J. Hedlund,* New Jersey, former vice chairman. Former president, Esso Middle East; former vice president, Exxon Corporation; chairman, board of trustees, American University in Cairo; trustee, American Museum of Natural History, New York.

Belton Kleberg "B." Johnson, Texas. Self-employed with interests in ranching, oil and gas, and diversified investments; corporate director, Campbell Soup Co., American Telephone and Telegraph Co., Tenneco Inc., and First City Bancorporation of Texas, Inc.; director, Texas and Southwestern Cattle Raisers Association; trustee, Deerfield Academy; director, Center for Inter-American Relations.

Dr. David E. Reichle, Tennessee. Associate director, Environmental Sciences Division, Oak Ridge National Laboratory; member, General Ecology Panel and Ecosystem Studies Panel, National Science Foundation; professor, Graduate Program in Ecology, University of Tennessee; serves on Agricultural and Renewable Resources Board of the National Academy of Sciences and the subcommittee on Environmental Conservation of the National Petroleum Council.

Dr. Beryl Robichaud Collins, New Jersey. Former senior vice president, McGraw-Hill, Inc.; associate research professor, Rutgers University, Center for Environmental and Coastal Studies, and associate member, Rutgers Graduate Faculty, Ecology; director, Aetna Life and Casualty Co. and G.D. Searle, Inc.; chairman, State of New Jersey Council for Natural Areas; trustee, New Jersey Conservation Foundation; board of directors, New Jersey Audubon Society; New Jersey Academy of Science, Advisory Council.

Mrs. Henry D. Sharpe, Jr., (Peggy),* Rhode Island. Former chairman, Zone II of the Garden Club of America; chairman, Citizens Advisory Board of Rhode Island Solid Waste Management Corporation; director, Rhode Island Conservation Law Foundation; chairman, Providence Street Tree Advisory Committee; trustee, Citizens Savings Bank.

Dr. David H. Stansbery,* Ohio. Professor of Zoology, Ohio State University; director, Ohio State University Museum of Zoology; senior research associate, Ohio Historical Society Division of Natural History; trustee, American Rivers Conservation Council, Columbus Audubon Society, Ohio Chapter of The Nature Conservancy; former chairman, Ohio Natural Areas Council; chairman, Freshwater and Mollusk Group, International Union for the Conservation of Nature.

*current member renominated

Official Ballot

Name (please print) _____

Address _____

_____

Signature _____

A valid ballot can be executed by a member in good standing. To cast your vote for the slate of officers and governors proposed by the nominating committee, return signed ballot to The Nature Conservancy, Assistant Secretary, 1800 N. Kent Street, Arlington, Virginia, 22209. To allow sufficient time for processing, ballots should be received by September 30, 1982.

Proposed by the Nominating Committee

NOMINATED AS OFFICERS

Mason Walsh, Jr., Pennsylvania, current chairman, is renominated. Senior vice president and general counsel, Richard K. Mellon and Sons; trustee of several charitable trusts and foundations; trustee of the Western Pennsylvania Conservancy; member, Advisory Committee, Wildlife-Wildlands Institute, Missoula, Montana; active conservationist.

Noel Lee "Skip" Dunn, North Carolina, current vice chairman, is renominated. Partner, Pilot Insurance Agency; trustee and senior vice president, Ducks Unlimited; past chairman, board of trustees, Izaak Walton League of America; member, board of directors, National Audubon Society; trustee, Forsyth County Nature Science Center; chairman, steering committee, North Carolina School of the Arts; director, Southeastern Center for Contemporary Art; chairman, Awards in the Visual Arts.

Donal C. O'Brien, Jr., Connecticut, current vice chairman, is renominated. Partner in law firm of Milbank, Tweed, Hadley & McCloy; chief legal counsel for the Rockefeller Family and Associates; former commissioner of the Connecticut State Board of Fisheries and Game and Connecticut Council of Environmental Quality; chairman, executive committee, National Audubon Society; trustee, Greenacre Foundation; member, board of directors, American Museum of Natural History and the International Atlantic Salmon Foundation; chairman, board of directors, Quebec-Labrador Foundation.

Mrs. Walter H. Page (Jane), New York, current member, is nominated as vice chairman. Board of trustees, Pierpont Morgan Library; vice chairman, board of trustees, Robert College of Istanbul, Turkey; secretary and former chairman, Long Island Chapter, The Nature Conservancy.

David L. Harrison, Colorado, current secretary, is renominated. Partner, law firm of Moses, Wittemyer, Harrison and Woodruff, Boulder; former chairman of the Conservancy's Colorado Chapter; co-author of articles on water use and land planning; Oak Leaf Award, The Nature Conservancy, 1978.

J. C. Brenton, Iowa, current treasurer, is renominated. Executive vice president and treasurer, Brenton Banks, Inc.; trustee, Iowa Chapter, The Nature Conservancy, instrumental in raising funds for the largest project campaign undertaken in Iowa (Behrens Pond and Woodland).

(over)

Date _____ REGIS. # _____

Check # _____
Amount _____
Balance Due _____
Refund Due _____

ABOVE AREA FOR OFFICIAL USE ONLY

REGISTRATION FORM

NAME(S) _____
(print name to appear on badge)

ADDRESS _____
Street City State Zip

TELEPHONE (residence) _____ (business) _____

CHAPTER _____

Membership or special classification:

☐ Conservancy member
☐ Governor Emeritus
☐ Board member
☐ Speaker
☐ Chapter trustee
☐ Staff member
☐ Life member
☐ Chapter chairman

Special requests:
☐ No meat diet ☐ Other

Events and Field Trips

Event	Fee per person	Attendees	Cost
Friday, October 1			
Opening Reception	included in registration fee	_____	N/A
Saturday, October 2			
Continental Breakfast	included in registration fee	_____	N/A
Annual Meeting Luncheon	included in registration fee	_____	N/A
Afternoon Field Trips:			
National Zoological Park	$10.00 X	_____ =	_____
National Arboretum	$10.00 X	_____ =	_____
Dumbarton Oaks	$10.00 X	_____ =	_____
Annual Awards Banquet	included in registration fee	_____	N/A

(continued on next page)

Event	Fee per person	Attendees	Cost
Sunday, October 3- Tuesday, October 5			
Post-conference Tour Virginia Coast Reserve	$125.00 X	_____ =	_____
Accommodations: (two nights)	single ..... $75.00 X	_____ =	_____
	double (per person) ..... $45.00 X	_____ =	_____
	twins (per person) ..... $45.00 X	_____ =	_____

(Trip includes three breakfasts, one crab feast, one bag lunch, one fish fry, bus and boat transportation.)

Post-conference Tour Cape May, New Jersey	$125.00 X	_____ =	_____
Accommodations: (two nights)	single, private bath ..... $110.00 X	_____ =	_____
	single, shared bath ..... $ 90.00 X	_____ =	_____
	double, private bath ..... $ 65.00 X (per person)	_____ =	_____
	double, shared bath ..... $ 55.00 X	_____ =	_____
	twin, private bath ..... $ 65.00 X	_____ =	_____
	twin, shared bath ..... $ 55.00 X (per person)	_____ =	_____

Note: Due to the special nature of the accommodations in these very special Victorian guest houses, no two rooms are alike. Rooms will be assigned on a first-come/first-served basis.

(Trip includes three breakfasts, two lunches, one dinner, bus and ferry transportation, and assistance from guides familiar with the avian and historic highlights of the New Jersey Cape.)

Field trips subtotal ..... $_____

REGISTRATION FEE

Attendance at The Nature Conservancy Annual Meeting is limited to members and their families.

The registration fee is $125.00 per person. The fee includes the Opening Reception cocktail buffet, a continental breakfast, the Annual Meeting Luncheon, and the Annual Awards Banquet, as well as other general meeting costs incurred by the Conservancy. Due to the necessity to make advance guarantees and reservations, there will be no substitutions or reductions in the listed fees.

FULL REFUNDS will be made prior to September 1, 1982. NO FULL REFUNDS of the Annual Meeting Registration Fee and the Field Trip Fees will be made after that date. Only in cases of emergency, the reasons for which must be submitted in writing to the Annual Meeting Coordinator, will PARTIAL REFUNDS be made. A percentage will be retained to cover deposits and other meeting-related costs.

Registration subtotal @ $125.00 per person ..... $_____

Field trips subtotal ..... $_____

TOTAL AMOUNT ENCLOSED ..... $_____

Please make checks payable to The Nature Conservancy.

Please mail to: Annual Meeting Registrar
The Nature Conservancy
1800 N. Kent Street
Arlington, VA 22209

MOST PEOPLE IMAGINE Latin America as a great stretch of land covered by a wide, green homogeneous mantle: the tropical jungle. And yet, the region that includes Central America, Mexico, the West Indies, and most of South America—the Neotropical Realm—supports the greatest diversity of natural communities in the world. More than a third of the Earth's biogeographic areas are represented in the Americas, and 75 percent of these are found in Latin America. The number of different ecosystem types occurring there is almost twice the number found in Africa and far greater than in all of Asia.

Latin America also boasts two of the largest river systems in the world—the Amazon and Orinoco—and the Andes, the longest mountain chain on any continent. In addition to the planet's most extensive rain forests, the Neotropics contain a remarkable range of panoramas: snow-covered peaks, barren deserts, vast steppes, wet and dry savannas. And the climate and topography of Latin America, along with its biological history, have brought about the evolution of an amazing wealth of species.

Unfortunately, many of Latin America's plant and animal species are disappearing. With them go opportunities for biological research; possible new sources of food, fuel, and medicine; and the variety that both shapes and sustains the continent. The loss is especially apparent in tropical areas.

Colombia

Tropical rain forests are the single largest repository of species on Earth. They contain 60 percent of all species, including an estimated 160,000 of the world's 250,000 vascular plants. Less than 1 percent of lowland tropical rain forests are currently protected.

Colombia, in the northwest corner of South America, is equivalent in size to Texas and Arkansas combined. It has three mountain chains, coastlines on both the Pacific and the Atlantic, and a large section of the lush Amazon Basin. This geography produces varied climatic conditions, from near-desert zones on the Guajira Peninsula to the renowned tropical rain forests on the Pacific coast, where rainfall measures up to 11 meters (433 inches) per year.

Colombia is believed to support the greatest number of bird species and subspecies in the world, approximately 2,600. It harbors more mammals than all of Africa south of the Sahara. Flowering plants number an estimated 50,000 species, of which only some 20,000 are known and named scientifically.

The accelerated growth of Colombia's population, the drive to find new avenues of industrial development, and the unplanned exploitation of natural resources are threatening Colombia's biological diversity. Destruction of the country's primary forests, including the species-rich rain for-

This photograph documents the third reported sighting of Gastrotheca andiquiensis*—the Andean marsupial frog —shown here with one of her 14 newborns. The offspring undergo their metamorphosis from tadpoles to fully formed frogs within a pouch in the mother's back.*

Above tree line at Colombia's Chingaza National Park in the Andes east of Bogota. Espeletia *plants in foreground.*

ests, is occurring at the rate of about 2 million acres per year, or 230 acres every hour. These virgin forests are being converted to pastures and cropland. In addition, erosion has destroyed some 50 million acres and is destroying another 30 million. Many species of plants and animals are threatened with extinction; thousands of others may disappear before they are even described by scientists.

Historically, conservation of natural resources in tropical countries, especially in Latin America, has not been a priority. Only very recently have isolated conservation groups initiated local efforts to protect the ecologically valuable lands in their countries.

Not until 1969 did the Colombian government create the Institute of Renewable Natural Resources (INDERENA). The equivalent of the U.S. Department of the Interior, INDERENA is responsible for identifying, protecting, and managing the country's natural resources. The agency began operations with a deficit budget and an

Two-toed sloth.

immense task. Shortly after it was founded, INDERENA sought international assistance in creating and establishing the Natural Resource Code, a document that lists the recommendations and rules for properly managing a country's resources. Today the code is Colombia's "conservation bible." Because of it, the government approved a law regulating the management and conservation of wildlife; and last year Colombia became a member nation of the Convention on International Trade in Endangered Species (CITES). (The Convention provides for regulation of worldwide trade in endangered and threatened plants and animals, including their by-products.)

INDERENA is currently responsible for managing 31 areas, which include national parks, flora and fauna sanctuaries, and faunistical territories. These lands total over 7.5 million acres, slightly more than 3 percent of the country. But not all of these parks and reserves are adequately safeguarded. Lack of funds and a shortage of personnel make guaranteed protection impossible. Consequently, many of these sites are merely "paper parks," their actual existence evident only on a map. Trained staff and the proper disposition of public and private funds are essential for protecting Colombia's reserves and sanctuaries. At the same time, 85 new critical sites have been identified for preservation.

A recent national crisis has taught the Colombian people that they are ultimately affected by the loss of natural resources. A year's severe drought, combined with destruction of the country's forested watersheds—which feed the principal sources of hydroelectric power—have necessitated energy rationing in nearly all the cities and towns of Colombia. Power outages occur as often as once a day and last up to six hours. The conservation community immediately reacted to the crisis, and the government launched conservation education campaigns. Economic and industrial development cannot take place if, at the same time, Colombia's natural wealth is depleted.

Chile

The recovery of disrupted ecosystems is slowest and most difficult in temperate zones and mountains where conditions for plant and animal life are much less favorable than they are in the tropics. Chile, the narrow strip of land in western South America between the Andes Mountains and the Pacific, is a case in point. Extending almost 4,500 kilometers (2,790 miles) from north of the Atacama Desert to south of Tierra Del Fuego, Chile differs from the other countries of Latin America in that it lacks truly tropical ecosystems.

Chile also differs from other Latin American countries because it has relatively few species. Nevertheless, many of its plants and animals are the most ancient species on the South American continent. Because of its formidable natural barriers—the Andean range on the east, the Atacama Desert on the north, and the Pacific Ocean on the west and south—Chile is isolated from the rest of South America. This isolation has enabled the ancient species to survive in competition against the newer species that have invaded the continent from Central America and the Caribbean. In addition, Chile has a large number of endemic species due to its great variety of isolated natural environments, especially in the country's Andean regions, where the greatest proportion of endemic plant and vertebrate species occurs.

One of Chile's endemic animals, the Darwin fox (*Dusycion fulvipes*) is found only on Chiloe Island. This fox differs from other members of its family by virtue of its short stature, an adaptation to the tangled understory vegetation found in its reduced habitat. If the planned massive exploitation of Chiloe is allowed to proceed, this rare canid will surely disappear. Preserving the country's native and ancient species is essential; but this is an enormous task in a country whose parks and biological reserves are currently threatened.

Because of its numerous national parks and reserves, Chile was considered one of Latin America's leaders in land conservation. Until 1979 the country had 52 forest reserves established between 1907 and 1978 and covering more than 19.5 million acres. Its national parks system is one of the oldest in Latin America. Created in 1925, the system comprises 50 units totaling more than 16.25 million acres, or about 8.66 percent of the country. Some units, however, do not merit designation as parks, either because they are located in marginal areas (owing to the toll taken by agriculture and forestry) or because they contain few ecologically significant natural features. These factors, together with government and private sector pressure to exploit the country's natural resources are causing the redefinition and consolidation of Chile's systems of reserves and national parks.

In spite of the situation described above, thousands of acres of park lands and forest reserves are now being sold to individuals whose only interests are developing the properties or exploiting the resources. At the same time, the ecological data (location and distribution of species, community types, critical ecosystems, etc.) essential to deter-

Opposite: Pacific coast of southern Chile.

mining which areas should be retained and conserved and which can be sold do not exist. The present dearth of such information about Chile—either for the present parks and reserves or for fragile, rarer areas not yet safeguarded—points out the need for a biological inventory like those The Nature Conservancy has undertaken through its state natural heritage programs.

Other problems plague conservation efforts in Chile: the lack of an administrative mechanism with the authority to guarantee the rational management of plant and animal species; a legal system that is unable to enforce legislation, such as its wildlife protection law; and, because of the restrictive nature of the legal system, a general attitude among Chileans that preserving wildlife is a worthless luxury that competes with local economic growth. Furthermore, in Chile, as in most Latin American countries, conservation is almost exclusively a government concern. Owing, in part, to a lack of funds and organizational abilities, there is not a strong private initiative to conserve natural resources. And unlike the United States tax laws, those in Chile do not encourage private philanthropy.

To grow economically, Chile must harvest its natural resources. But because there exists no conservation tradition, resource planning and management are generally short-range: the long-range productive potential of resources is sacrificed to maximizing immediate gains. Such a short-sighted approach poses the greatest threat to Chile's biotic diversity.

Caracara, Chile.

Fuchsia magellanica.

To initiate and sustain conservation efforts in both Colombia and Chile and throughout Latin America, it is necessary to expand private endeavors and to foster the participation of governmental conservation agencies. Cooperation between the countries' governments and private conservation groups is essential. Without this mutual collaboration, critical ecological information cannot be accumulated, funds cannot be raised and properly allocated, and personnel required to manage designated natural areas will remain insufficient. Furthermore, any comprehensive strategy must consider not only a country's conservation priorities, but also its economic and cultural character.

Ernesto Barriga-Bonilla is the Conservancy's Latin American Field Representative. In addition to 14 years' teaching experience at the National University of Colombia in Bogota, he served as associate director of the Peace Corps in Colombia, responsible for the Corps's Environmental Protection/Conservation Programs. **Anne M. Byers** is Associate Editor and senior writer for *The Nature Conservancy News*.

ECOLOGY FORUM

No. 45
by F. William Burley
Director of Science
International Program

SHARING THE HERITAGE CONCEPT

Confronted with the loss of thousands of species and entire ecosystems worldwide, how can those of us concerned with the preservation of natural diversity best determine conservation priorities? One way the Conservancy can contribute effectively is to share with other nations the inventory methodology it has developed through its natural heritage programs—undertaken in cooperation with 28 state governments over the past 8 years. Established to provide a continuous process for identifying significant natural areas on a state-by-state basis, the natural heritage programs catalogue information on the components or "elements" of a state's natural diversity: those ecological entities (plant and animal species, plant communities, aquatic systems, critical habitats, and other natural features) of particular interest because they are exemplary, rare, or endangered at the state or national level.

The adaptation of heritage methods for use in other countries is well under way. A heritage program has been operating in Argentina for nearly two years, one is beginning in the Netherlands Antilles, and the Conservancy's International Program is negotiating for programs in a number of other countries, including Ecuador, Venezuela, Costa Rica, and New Zealand. Although most of the Conservancy's international efforts are concentrated in Latin America, we are eager to assist any country that expresses an interest in our work. In order to share heritage methodology beyond our borders, we are expanding and modifying the inventory methods, fashioning them to meet the specific conditions of other countries and regions.

Three problems in adaptation immediately appear. First, the geographical scale of these countries and regions is often formidable. Although nations such as Ecuador and Costa Rica are relatively small in size, Brazil, Mexico, Australia, and numerous others dwarf any of the heritage states. The larger the size of the area to be inventoried, the greater the complexity of the task—and the more arduous the management of accumulated data. Second, the rest of the world presents us with an almost overwhelming amount of biological diversity, especially in tropical areas. For example, Venezuela has more than 25,000 vascular plant species (many of them very poorly known or still undescribed in the scientific literature), more than four times as many as California, our most biologically diverse state. To manage specific locality information for thousands upon thousands of species, an inventory may have to become "selective" to the point of arbitrariness. Third, there is a conspicuous absence of good biological data in many other nations—too few biologists, ecologists, taxonomists, and too little time in the next decade to gather information sufficient to power a traditional heritage program data base. Since we will never be able to *comb* South America for rare and threatened species, some conservation decisions must be made now, on the basis of the facts that are in.

A heritage program outside the United States need not follow the Conservancy's methods in every detail. That would be difficult and probably unwise. But a few general rules are universally applicable in establishing biological inventories to determine conservation priorities. For instance, each inventory should aim at taking an element-oriented (rather than a site-by-site) approach initially. That is, the inventory should first determine, with as much accuracy as possible, which individual species, communities, and ecosystems are most critically jeopardized; only then should it determine which sites can best protect good examples of those critically jeopardized elements. This order of implementation is essential because sites are difficult or impossible to compare without first addressing the status of the individual elements of diversity they harbor.

Another heritage prerequisite is the ensured longevity of an inventory's data base. A short-term study is quickly outdated, its findings soon inaccurate; but a continuous inventory is enriched, updated, and refined as new data become available. Since its efficacy is enhanced with time, such a data base becomes (at least in theory) a closer and closer approximation of the natural world it is cataloguing.

It is also a general rule that wherever an inventory is launched, there must be a way to set data-collection priorities so as to avoid wasting time and resources on species or ecosystems that are evidently secure. An assessment process on the order of the Conservancy's innovative natural diversity "scorecards" (reports that assess the status of a state's natural heritage by ranking individual elements according to relative rarity and endangerment throughout their ranges) should be a program objective for international heritage inventories from the outset. A program should make its assessment using major ecosystem types as a criterion (this is the "coarse filter" method, described below) as well as individual species (which constitute, in combination, a "fine filter"). Clearly, none of these general guidelines for heritage programs beyond our borders makes sense unless there are established channels through which program recommendations can be implemented—or at least distributed widely to conservation organizations, agencies, and government departments.

Outside the United States, especially in the tropics, greater emphasis must be placed on the coarse-filter method: on analyzing the distribution and protection status of major ecosystem types, rather than the distribution and protection status of individual species. The underlying assumption here is that if good examples of all major ecosystems, plant communities, and habitats are represented in a nation's system of parks and protected areas, then most (perhaps 75 percent) of the full array of indigenous species will be conserved, if only fortuitously.

One simple way to begin this coarse filter analysis is to produce a system of map overlays—say, for Latin America as a region or for individual countries. This can be done manually with clear plastic sheets, each of which illustrates a different subset of pertinent information. Or it can be done by computer, in the form of composite maps, once the geographic information has been "digitized" (a process by which graphics are converted to a series of points for entrance into the computer). These overlays may depict vegetation types, life zones, biogeographic provinces, and known centers of high diversity or endemism—matched to a map of existing parks and protected areas. In this way, apparent gaps in coverage can be identified. (One must leave aside, for the moment, the *actual* protection status of "managed areas," since efficient management of conservation areas is by no means a given.) In addition, some distribution and occurrence data for selected critical species or specific ecosystems can be added, if reliable information is available.

This overlay method has recently been used quite elegantly in Brazil. Major provinces for vascular plants were delineated first. Then distributional data and centers of endemism were mapped for lizards, birds, and butterflies. Important refuge areas for some species during the Pleistocene (Ice Age) were located and mapped. Areas of high ecological significance were determined after combining and analyzing all of these. Today, Brazil's federal government is expanding its system of parks and protected areas with large new units to "capture" major ecological features and species previously unrepresented. It will be years before Brazil's flora and fauna are known in finer detail; meanwhile, the overlay process has provided a workable means of setting broad conservation priorities.

The Fundacion para la Defensa de Natura (FUDENA), Venezuela's leading conservation organization, and the Conservancy recently completed a much smaller project of this kind for Venezuela. Map overlays included protected areas of all types, life zones (based on a system developed by biologists Leslie Holdridge and Joseph Tosi in mapping Costa Rica), centers of high endemism for plant species, and locality data for about 30 mammal and reptile species of special interest. One of this study's preliminary conclusions was that tropical moist forests in Venezuela are already well-represented in existing parks and protected areas—but dry forest vegetation types and the grasslands of the plains (or *llanos*) are under-represented. This, of course, is a cursory analysis, a rough start to be expanded and improved upon as more and more data are gathered and a permanent inventory is ensconced. The steps to be taken toward that goal are: one, to establish heritage-style manual files; two, to begin identifying priorities for further data collection (species information is a high priority for future field investigation); and three, to make preliminary analyses of the data.

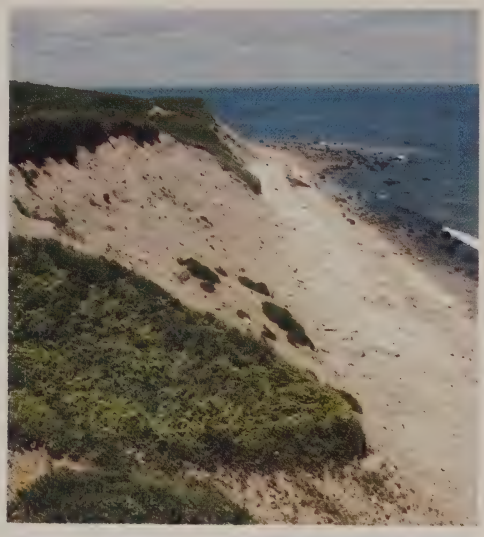
The Conservancy is not currently working in Brazil, but the steps to be taken there would approximate those outlined for Venezuela—though the effort would be taken on state by state, in all probability. Drawing upon the findings of existing

regional fauna and flora inventory projects, data bases could begin collecting any and all information relevant to conservation of ecosystems and species. The current working model of creating large new national parks could then be supplemented by more localized conservation efforts to fill in identified gaps.

A disturbing sense of urgency pervades the Conservancy's effort to share the heritage concept internationally. Tropical moist forests are disappearing at an unbelievable pace (one to two acres *per second),* and the rate of species extinction is rising precipitously. One example: three families of primates endemic to a narrow strip of forest in eastern Madagascar are at risk as that strip is narrowed further and converted to agriculture. Their forest habitat will disappear entirely in less than a decade unless emergency action is taken to set up large reserves. An accounting of other emergency cases could fill pages.

An equally disturbing fact is that we really don't know how many species exist, or of those, how many are currently in danger. Perhaps as few as 20 percent of the estimated 10 million species on Earth have been formally described by taxonomists—and are "known," to whatever degree. What about the other 8 million? Beyond this, almost every serious ecological study or investigation recognizes ever more community types, each of which should be represented in any system of parks and protected areas. It seems inevitable, given all of this, that heritage data bases in many countries will always operate from a position of data insufficiency. Happily, the heritage structure was designed to accommodate these less-than-desirable conditions: its information-gathering process is cyclical, cumulative, increasingly selective, and self-correcting. Despite recognizable data gaps, a heritage program quickly becomes the single most comprehensive repository of practical conservation information for a state, region, or country.

No single methodology is the panacea for the world's conservation woes, but by sharing the heritage concept, the Conservancy is doing what it does best to stave off biological impoverishment. If we are to succeed in the crucial decade ahead, we must plan the lifeboat rescue carefully in the next two or three years, applying the Conservancy's expertise in setting conservation priorities at home—sharing it, adapting it, modifying it to meet the needs of other nations. By helping to initiate heritage-style programs abroad (with special attention to tropical regions), the Conservancy's International Program is taking a strong stand against the further simplification of the world's ecosystems.



October Deadline for Key Block Island Project

Block Island—ten miles off the Rhode Island coast—is known to summer visitors, sailors, and birdwatchers around the world for its pastoral landscape, steep seafront bluffs, and rich birdlife (more than 275 species at last count). At present, only 5 percent of its 6,070 acres is protected against encroaching development.

In the southwest corner of the island, a currently unprotected grassland property sweeps down to an undisturbed coastline. This is the Dickens Farm: a haven for nesting birds (including the state-endangered upland sandpiper and marsh hawk) as well as a number of rare plants. The Maryland golden aster grows here (at its only known New England site), as does the largest Rhode Island population of the nationally significant rockrose.

In concert with the Audubon Society of Rhode Island and the Block Island Conservancy, Inc., The Nature Conservancy has secured options to purchase 150 acres here. Unless $400,000 (40 percent of the total purchase price) can be raised by October 1, 1982, this outstanding grassland habitat may be lost to development.

For further information, please write to the New England Field Office (see address on back cover). Contributions should be made payable to: The Nature Conservancy —Dickens Farm.

NEW PROJECTS

FLORIDA

Sand Hill Project, Hobe Sound National Wildlife Refuge—Addition—(Martin County). With the gift of an additional 7.5 acres from Nathaniel P. Reed, the Conservancy has enhanced the existing refuge with a healthy remnant of exceptionally mature sand pine scrub: the state's oldest plant community type, and arguably its richest in rare species. Heavy development along Florida's east coast has all but eliminated the scrub communities that once cloaked relict beach dunes for miles. The Sand Hill area supports jeopardized plant species (beach creeper, which is threatened in Florida, scrub mint and Indian pipe, which are candidates for federal protection) and provides habitat for the state-threatened gopher tortoise and rare Florida scrub lizard. The tract will be conveyed to the U.S. Fish and Wildlife Service, bringing Conservancy Sand Hill Project additions to the refuge to 61 acres.

ILLINOIS

Lake Forest Preserve—Addition—(Lake County). A lightly wooded 8.5-acre gift of Mr. and Mrs. Charles C. Haffner III serves to link portions of the adjacent sanctuary—a sweep of forest with wet and dry prairie openings. Lying along the North Branch of the Chicago River, the addition extends protection at the south end of the preserve, an assemblage of Conservancy and Lake Forest Open Lands Association holdings in northeastern Illinois. Conservancy lands here (now some 53 acres all told) are leased to the Association and managed as part of a wildlife sanctuary for research and recreation.

INDIANA

Gary Dune Forest (Lake County). The subdivision map seemed to destine this high dune for suburban development. Surrounded by outlying Gary, Indiana, just off the Lake Michigan shoreline, the dune had been platted into numerous small lots that fragmented the seamless natural stretch (dry dune forest, sand reed/little bluestem dry sand prairie, and dry-mesic dune forest) with a crazy-quilt of property ownerships. But a two-acre (four-lot) gift to the Conservancy from John E. Smith changed the prospects for protection here, spurring activity on some 25 adjacent acres. The National Oceanic and Atmospheric Administration's Coastal Zone Management study team has called this the finest dune forest outside the Indiana Dunes National Lakeshore, and the Indiana Heritage Program has nominated it for inclusion in the Indiana Natural Areas Registry. Two state-threatened plants (roundleaf dogwood and prostrate juniper) and two plants of special concern in the state (jack pine and arctic bearberry) occur on the site. Soon to be dedicated by the Indiana Department of Natural Resources' Division of Nature Preserves, Gary Dune Forest is currently managed by Great Lakes Forest and Wildlife Restoration, Inc.

Ritchey Woods (Hamilton County). A 123-acre stretch of mixed woods and fields in residential Indianapolis has been bequeathed to the Conservancy by Dr. James O. Ritchey. The land offers excellent opportunities for environmental education and field experiences in a near-urban area and will be managed accordingly by the Children's Museum, to which it's been conveyed. Ritchey Woods is charted for dedication as an Indiana state nature preserve.

NEW HAMPSHIRE

Stonedam Island (Belknap County). It's the largest undisturbed island in New England's largest lake—and free, now, of the 18th-century stone dam that once connected it to shore. From the island's heights, you can see two New Hampshire mountain ranges: the Belknaps to the southeast and the Whites to the northeast. The Conservancy assisted the Lakes Region Conservation Trust, a local conservation organization, in acquiring 113 acres on Lake Winnipesaukee's wooded Stonedam Island. Two rare plant species *(Melampyrum lineare* and *Amphicarpa bracteata)* grow here: and wildlife is abundant, with a tally of 14 mammal species, 4 amphibians, and 34 woodland and aquatic birds. The island property will be managed by the Trust for preservation of its natural values.

WISCONSIN

Apple River Tract (St. Croix County). A final two-thirds interest in a 115-acre gift from Otto Silha safeguards marsh, bottomland forest, and dry oak woodland at the confluence of northwestern Wisconsin's Apple and St. Croix Rivers. Significant as waterfowl habitat, and for sightings of bald eagles and osprey, the property will be included in the contiguous St. Croix Islands Wildlife Area and leased to the Wisconsin Department of Natural Resources for management.

Vina Plains

Conversion to row crops, orchards, and rice fields has transfigured the surrounding landscape—but this slightly undulating expanse still sports its native annual grasses. Just 50 miles north of Sacramento, Vina Plains is a high-ranking project of the Conservancy's California Critical Areas Program, which has targeted examples of the state's 11 most jeopardized ecosystems for protection. Two of these occur at Vina Plains; central valley grasslands and vernal pools.

And what a constellation of vernal pools it is —some as large as four acres! Floored with impervious clay, these depressions fill with water in winter and slowly dry out in spring, leaving concentric circles of wildflowers behind in the process. Beyond the pool margins, the grassland itself also flowers in the spring (with goldfields, shooting stars, wild hyacinths, mariposa lilies, larkspur, soap plants. . .), taking on a shimmery, painted look. Two plants listed by the state as rare or endangered (and by the Interior Department as candidates for federal protection) occur in the area: *Euphorbia hooveri* and *Orcuttia pilosa.*

Conservancy acquisition of 1,527 acres here in Tehama County has established the eastern portion of a projected 4,500-acre preserve, to be managed in conjunction with nearby Chico State University. The California Field Office aims to raise $667,700 to cover project costs and create a stewardship endowment. With only a fraction of one percent of California's original grasslands remaining, the protection of Vina Plains is well worth cheering about—another notable success of the Conservancy's exemplary California Critical Areas Program.

COTTAGES AVAILABLE AT MILE HI

Modern housekeeping cottages overlooking a mountain creek are available for rental year-round at the Conservancy's Mile Hi Preserve. Located 90 miles southeast of Tucson in the Huachuca Mountains, the Mile Hi stretches across the mouth of Ramsey Canyon, one of the most lovely and biologically diverse canyons in southern Arizona. To arrange a visit or obtain a brochure and birdlist, write: The Mile Hi, RR 1, Box 84E, Hereford, Arizona 85615. Phone: (602) 378-2785.

VISIT A MONTANA RANCH

Join us this summer and explore the Conservancy's extraordinary Pine Butte Swamp Preserve—spectacular surroundings for riding, hiking, fishing, photography, birdwatching . . . or just relaxing.

Al and Sally Haas invite you to stay at a unique dude ranch in the heart of Montana's Rocky Mountain Front. For more information, contact the Circle 8 Ranch, P.O. Box 457, Choteau, Montana 59422/ (406) 466-5564.

ADIRONDACK MOUNTAINS

Containing 9,000 square miles in northern New York, the Adirondack Park is the largest protected sanctuary in the continental U.S. Over 2½ million acres of the Park are protected as "forever wild."

The Adirondack tour offers Conservancy members and their guests the chance to visit the Park on the weekend of September 24 to 26, 1982. You will learn about the role the Adirondack Conservancy has played in preserving this vast wilderness, and stay at the famous and historic Ausable Club, which owns and protects over 7,000 acres in the heart of the high peaks region of the Adirondacks. The cost of the trip is $135.00. Don't miss this visit to "the land that nobody knows."

For details, write to Adirondack Fall Tour, c/o Travelworld, 1500 Wilson Boulevard, Arlington, Va. 22209 or call (703) 525-3605.

VISIT DOG ISLAND

It's a pristine barrier island 20 miles off Florida's Gulf Coast—and you're invited! The Conservancy owns 75 percent of 1,800-acre Dog Island at the eastern end of Apalachicola Bay. Its beaches offer the finest shelling in the state, and there are countless other recreational opportunities. Eight modern apartment units are available for rental. For more information write to Mr. Dan Tonsmeire, c/o The Pelican Club, P.O. Box 301, Carrabelle, Florida 32322, or call (904) 697-2839. Conservancy members will receive special consideration.

UNUSUAL INCOME OPPORTUNITY

The Nature Conservancy's NEW Pooled Income Fund

Do you own highly appreciated stocks with a low yield?

If you want to increase your income, but don't want to sell these stocks because of the capital gains tax you would have to pay . . .

You might consider donating these securities to our new Pooled Income Fund. Through this fund, we can:

- Sell these securities without paying any capital gains tax, and reinvest the entire proceeds for a high yield; and
- Pay *you* the income from this gift for the rest of your life.

In addition, because this is a new fund, you will be entitled to an income tax deduction which could be as much as two to three times as large as that offered by most older funds.

If you want to explore, confidentially, how such a gift might increase your annual income, please contact Alice A. Pinsley, Director of Capital Giving, The Nature Conservancy, 1800 North Kent Street, Arlington, Virginia 22209, (703) 841-5374.

Free copies of the Conservancy's 1975 study of natural area activities by the federal government—*Preserving Our Natural Heritage,* volume 1—are now available from the following address:

Div. of Natural Science [494]
National Park Service
Washington, D.C. 20240

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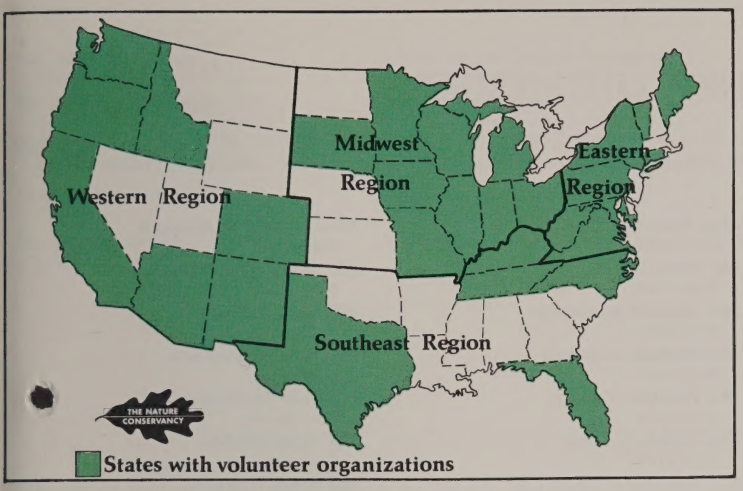

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The following is a list of all Conservancy chapters and committees as well as their current mailing addresses and chairmen. The News will publish an update of this list from time to time.

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Tucson, AZ 85717
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Bli[illegible] ID 83314
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Boston, Massachusetts 02108
(617) 542-1908

Midwest Regional Office
328 East Hennepin Avenue
Minneapolis, Minnesota 55414
(612) 379-2134
John W. Humke, Vice President

Southeast Regional Office
P.O. Box 270
Chapel Hill, North Carolina 27514
(919) 967-5493
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Western Regional Office
156 Second Street
San Francisco, California 94105
(415) 777-0541
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International Office
4 East Loudoun Street
Leesburg, Virginia 22075
(703) 777-2680
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Arizona Field Office
30 N. Tucson Blvd.
Tucson, Arizona 85716
(602) 327-4478
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Arkansas Field Office
300 Spring Building
Little Rock, Arkansas 72201
(501) 372-2750
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156 Second Street
San Francisco, California 94105
(415) 777-0487
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1732 Pearl Street
Denver, Colorado 80203
(303) 837-0505

Florida Field Office
1331 Palmetto Avenue, Suite 205
Winter Park, Florida 32789
(305) 628-5887
Michael L. Green, Director

Hawaii Project Office
1026 Nuuanu Avenue, Room 201
Honolulu, Hawaii 96822
(808) 537-4508

THE NATURE CONSERVANCY

National Office
1800 North Kent Street
Arlington, Virginia 22209
(703) 841-5300

Address Correction Requested

Illinois Field Office
79 West Monroe Street
Suite 708
Chicago, Illinois 60603
(312) 346-8166
Ralph Brown, Director

Indiana Field Office
415 East 4th Street
Bloomington, Indiana 47401
(812) 339-7547
William Weeks, Director

Iowa Field Office
424 10th Street, Suite 311
Des Moines, Iowa 50309
(515) 244-5044
Larry Cantera, Director

Maryland/Delaware Field Office
Chevy Chase Center Office Bldg.
35 Wisconsin Circle, Suite 304
Chevy Chase, Maryland 20015
(301) 656-8673
Steve Hamblin, Director

Michigan Field Office
Suite E, 531 Clippert Street
Lansing, Michigan 48912
(517) 332-1741
Tom Woiwode, Director

Minnesota Field Office
328 East Hennepin Avenue
Minneapolis, Minnesota 55414
(612) 379-2134

Mississippi Field Office
P.O. Box 747
Winona, Mississippi 38967
(601) 283-4276
James Sumner, Director

Missouri Field Office
7208 Weil Avenue
St. Louis, Missouri 63119
(314) 645-6822
Rod Miller, Director

Montana/Wyoming Office
P.O. Box 258
104 W. Broadway—2G
Helena, Montana 59624
(406) 443-0303
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New England Field Office
294 Washington Street, Room 850
Boston, Massachusetts 02108
(617) 542-1908
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New Mexico Field Office
610 Gold Avenue, S.W.
P.O. Box 1846
Albuquerque, New Mexico 87103
(505) 242-2015
William C. Briggs, Director

New York Field Office
282 Delaware Avenue
Delmar, New York 12054
(518) 439-0230
Charles Bassett, Director

North Carolina Field Office
P.O. Box 805
Chapel Hill, North Carolina 27514
(919) 967-7007
William de Buys, Director

North Dakota Field Office
P.O. Box 693
Bismarck, North Dakota 58502
(701) 224-1182
Robert Horne, Director

Ohio Field Office
1504 West 1st Avenue
Columbus, Ohio 43212
(614) 486-4194
David Younkman, Director

Oregon Field Office
1234 N.W. 25th
Portland, Oregon 97210
(503) 228-9561
Sam Johnson, Director

Pennsylvania/New Jersey Office
1218 Chestnut Street, Suite 1002
Philadelphia, Pennsylvania 19107
(215) 925-1065
R. T. Cook, Director

South Carolina Field Office
P.O. Box 5475
Columbia, South Carolina 29250
(803) 254-9049
LaBruce Alexander, Director

Tennessee Field Office
202 Capitol Blvd. Building
P.O. Box 3017
Nashville, Tennessee 37219
(615) 242-1787

Texas Field Office
503 B East 6th St.
Austin, Texas 78701
(512) 479-0301
R. Scott Spann, Director

Vermont Field Office
7 Main Street
Montpelier, Vermont 05602
(802) 229-4425
Robert J. Klein, Director

Virginia Field Office
619 E. High Street
Charlottesville, Virginia 22901
(804) 295-6106
Brian Shult, Director

Washington Field Office
618 Smith Tower
Seattle, Washington 98104
(206) 624-9623
Elliot Marks, Director

West Virginia Field Office
1100 Quarrier Street, Room 215
Charleston, West Virginia 25301
(304) 345-4350
Ed Maguire, Director

Wisconsin Field Office
923 Williamson
Madison, Wisconsin 53703
(608) 251-8140
Russell Van Herik, Director

Connecticut Chapter
Science Tower, Box MMM
Wesleyan Station
Middletown, Connecticut 06457
(203) 344-0716
W. Kent Olson, Director

Kentucky Chapter
P.O. Box 4207
Lexington, Kentucky 40544
(606) 277-1214
Hugh Archer, Director

Maine Chapter
20 Federal Street
Brunswick, Maine 04011
(207) 729-5181
John W. Jensen, Director

Long Island Chapter
P.O. Box 72
Cold Spring Harbor, New York 1
(516) 367-3225
Scott A. Sutcliffe, Director

Lower Hudson Chapter
RFD #2, Chestnut Ridge Road
Mt. Kisco, New York 10549
(914) 666-5365
David L. Weld, Director

Adirondack Conservancy
P.O. Box 188
Elizabethtown, New York 12932
(518) 873-2610
Timothy Barnett, Director

Eastern New York Chapter
282 Delaware Avenue
Delmar, New York 12054
(518) 439-0233
Anne Williams, Director

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